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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|-------------------------------|
| 10/667,775 | 09/22/2003 | Manoj K. Sinha | 2008.007500 | 9545 |
| 23720 | 7590 | 04/19/2005 | | |
| WILLIAMS, MORGAN & AMERSON, P.C. 10333 RICHMOND, SUITE 1100 HOUSTON, TX 77042 | | | | EXAMINER NGUYEN, VAN THU T |
| | | | | ART UNIT 2824 |
| | | | | PAPER NUMBER |

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/667,775 | SINHA ET AL. | |
| | Examiner | Art Unit | |
| | VanThu Nguyen | 2824 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6, 9-17, 20-22 is/are rejected.
- 7) Claim(s) 7,8,18 and 19 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 January 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>09/22/2003</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. Claims 1-22 are pending.

Claim Objections

2. Claims 2-11, 14-21 are objected to because of the following informalities: "A device" or "A method" on line 1 of each claim. Appropriate correction is required, such as --The device-- or --The method--.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6, 9-17, 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (U.S. Patent No. 5,532,958).

Regarding claim 1, Lee discloses a device comprising:

a sensor (resistors TVM and TIM in Fig. 5) adapted to provide a signal responsive to temperature;

and a refresh rate control unit (elements in Fig. 9 and all elements in Fig. 5 except TVM and TIM) operatively coupled with said sensor, said refresh rate control unit being adapted to adjust a refresh rate associated with at least a portion of said device in response to said temperature signal (memory cell array 10 is refreshed in response to refresh signal ΦT, see Fig. 4).

(See column 4, lines 18-28 and column 5, lines 17-55).

Regarding claim 2, Lee discloses the refresh control unit is adapted to increase the refresh rate in response to detecting an increased temperature (see column 1, line 33 to column 2, line 4 and Figs. 1 & 2).

Regarding claim 3, Lee discloses said refresh rate control unit further comprises:

a comparator (one of the comparators CP1, CP2, CP3 as shown in Fig. 5) coupled to receive the temperature responsive signal at a first input terminal and a reference signal (one of the reference voltages Vref1, Vref2, Vref3 as shown in Fig. 5) at a second input terminal, said comparator being adapted to deliver a first signal in response to the temperature responsive signal being less than the reference signal and a second signal in response to the temperature responsive signal rising above the reference signal (the on/off of one of the signals TC1, TC2, TC3); and

an oscillator (all elements in Fig. 9 except inverters I1, I2, I3) adapted to produce a refresh signal ΦT at a first preselected rate in response to receiving the first signal and at a second preselected rate in response to receiving the second signal.

Regarding claim 4, Lee discloses the oscillator includes a counter (counting circuit 26 shown in Fig. 9) and a logic circuit (elements in 32 except inverters I1, I2, I3 shown in Fig. 9) adapted to select a first bit of the counter to produce the refresh signal in response to receiving the first signal and select a second bit of the counter to produce the refresh signal in response to receiving the second signal.

Regarding claim 5, Lee discloses the comparator is further adapted to deliver the first signal in response to the temperature responsive signal falling a preselected magnitude below the reference signal (see Figs. 7 and 8 for temperature ranges).

Regarding claim 6, Lee discloses the comparator includes a hysteresis effect (output of the comparators CP1, CP2, CP3 shown in Fig. 5 being latched via inverters I1, I2, I3 as shown in Fig. 9).

Regarding claim 9, Lee discloses the sensor is thermally coupled with the device.

Regarding claim 10, Lee discloses the sensor is at least partially formed within a common substrate with the device (all built in a chip, see Abstract).

Regarding claim 11, see rejection of claim 3 above.

Regarding claim 12, see rejection of claim 1 above.

Regarding claims 13-17, 20-21, they encompass the same scope of invention as to that of claims 1-6, 9-12 except they draft in method format instead of apparatus format. The claims are therefore rejected for the same reason as set forth above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Merritt (U.S. Patent No. 6,452,845).

Regarding claim 22, Lee discloses a system comprising:

a memory (memory cell array 10 shown in Fig. 4);

memory controller (all elements in Fig. 4 except memory cell array 10) coupled to receive external control signals such RAS, CAS and address, and being adapted to control refresh operations of the memory, the memory controller comprising:

a sensor (resistors TVM and TIM in Fig. 5) adapted to provide a signal responsive to temperature of at least a portion of the memory; and

a refresh rate control unit (elements in Fig. 9 and all elements in Fig. 5 except TVM and TIM) operatively coupled with said sensor, said refresh rate control unit being adapted to adjust a refresh rate associated with at least a portion of said memory (memory cell array 10) in response to said temperature signal.

However, Lee does not disclose a processor.

Merritt discloses, in Fig. 4, a processor 52 coupled to memory controller 62, which controls operations in memory 100.

Since Lee and Merritt are both from the same field of endeavor, the purpose disclosed by Merritt would have been recognized in the pertinent art of Lee.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to include a processor in the memory system because it is an essential component for memory operations.

Allowable Subject Matter

7. Claims 7-8, 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowability:

The prior art made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Lee and Merritt, taken individually or in combination, do not teach the claimed invention having the following limitations, in combination with the remaining claimed limitations:

- i) a digital filter coupled electrically intermediate the comparator and the oscillator (as in claim 7); or
- ii) applying digital filtering to the comparing operation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VanThu Nguyen whose telephone number is (571) 272-1881. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 16, 2005



VanThu Nguyen
Primary Examiner
Art Unit 2824